इंटरनेट मानक

Disclosure to Promote the Right To Information

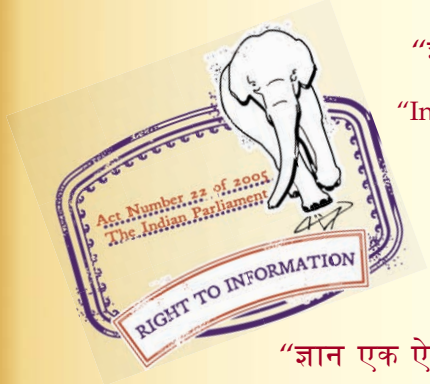
Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 5062-5 (2004): Methods of test for brown coals and lignites, Part V: Determination of acetone soluble material in the benzene extract brown coals and lignites [PCD 7: Solid Mineral Fuels]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"



"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

PROTECTED BY COPYRIGHT

IS 5062 (Part 5) : 2004
ISO 1017 : 1985

भारतीय मानक

भूरा कोयला और लिग्नाइट की परीक्षण पद्धतियाँ

भाग 5 टॉल्यून-विलेय निष्कर्षण में एसीटोन-विलेय सामग्री (रालीय पदार्थ) ज्ञात करना

(पहला पुनरीक्षण)

Indian Standard

METHODS OF TEST FOR BROWN COALS AND LIGNITES

PART 5 DETERMINATION OF ACETONE-SOLUBLE MATERIAL (RESINOUS SUBSTANCES) IN THE TOLUENE-SOLUBLE EXTRACT

(First Revision)

ICS 75.160.10

© BIS 2004

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

November 2004

Price Group 1

NATIONAL FOREWORD

This Indian Standard (Part 5) (First Revision) which is identical with ISO 1017 : 1985 'Brown coals and lignites — Determination of acetone-soluble material ("resinous substances") in the toluene-soluble extract' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendations of the Solid Mineral Fuels Sectional Committee and approval of the Petroleum, Coals and Related Products Division Council.

This Indian Standard was first published in 1973 which was essentially based on ISO/R 1017-1969 'Benzene extract from brown coals and lignites — Determination of acetone-soluble material (resinous substances)' issued by the International Organization for Standardization (ISO). Since ISO/R 1017-1969 has subsequently been published as ISO 1017 : 1975 and revised in 1985, the Committee has decided to revise this standard to completely align it with ISO 1017 : 1985 under dual number standard. Consequently the designation and title of the standard has been modified as follows:

IS 5062 (Part 5) /ISO 1017 : 1985 'Methods of test for brown coals and lignites: Part 5 Determination of acetone-soluble material (resinous substances) in the toluene-soluble extract (*first revision*)'

The text of ISO Standard has been proposed to be approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

CROSS REFERENCE

In this adopted standard reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is listed below along with its degree of equivalence for the edition indicated. However, that International Standard cross-referred in this adopted ISO Standard which has subsequently been revised, position in respect of latest ISO Standard has been given:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 975 : 1985 Brown coals and lignites — Determination of yield of toluene-soluble extract	IS 5062 (Part 4) : 2004 Methods of test for brown coals and lignites: Part 4 Determination of yield of benzene soluble extract-semi-automatic method	Identical

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

Indian Standard

METHODS OF TEST FOR BROWN COALS AND LIGNITES

PART 5 DETERMINATION OF ACETONE-SOLUBLE MATERIAL (RESINOUS SUBSTANCES) IN THE TOLUENE-SOLUBLE EXTRACT

(First Revision)

1 Scope and field of application

This International Standard specifies a method of determining the amount of acetone-soluble material ("resinous substances") in the toluene-soluble extract from brown coals and lignites.

NOTE — The acetone extract will also contain a percentage of wax dissolved simultaneously with the "resinous substances".

2 Reference

ISO 975, *Brown coals and lignites — Determination of yield of toluene-soluble extract.*

3 Principle

The sample of toluene-soluble extract from brown coal or lignite obtained by the procedure described in ISO 975 is extracted with acetone at a temperature of 18 to 22 °C. The soluble fraction is filtered or centrifuged off and, after evaporation of the solvent, dried to constant mass. The percentage of acetone-soluble material is calculated from the mass of residue after drying.

4 Reagent

Acetone, of analytical reagent grade.

WARNING — Acetone is flammable and toxic by inhalation, ingestion or skin absorption.

5 Apparatus

5.1 Centrifuge, capable of operating at 1 600 r/min.

The rotational frequency of the centrifuge shall be sufficient to ensure separation of the soluble fraction from the parent coal.

5.2 Glass vessels, either cylindrical or conical, of 15 ml capacity and fitted with ground glass stoppers, for use in the centrifuge.

5.3 Evaporating dish, of glass or silica, about 20 mm high and 50 mm in diameter.

5.4 Vacuum drying oven, electrically heated, in which a temperature of 80 ± 2 °C and a pressure of about 50 kPa can be maintained.

5.5 Air oven, electrically heated, capable of maintaining a temperature of 100 to 110 °C.

5.6 Infra-red drying lamp.

5.7 Wire cloth test sieve, of nominal aperture size 100 µm.

6 Preparation of sample

The residue obtained from the toluene-soluble extract obtained by the method specified in ISO 975 shall be crushed to pass the sieve (5.7).

If the residue is a viscous liquid, it shall be cooled in solid carbon dioxide to — 80 °C, and then crushed.

7 Procedure

7.1 Test conditions

The high selectivity of acetone requires a strict temperature control during the determination. The temperature of the solvent, the room temperature at the beginning of the determination and the room temperature at the end of the determination shall not differ from each other by more than 0,5 °C and shall be within the range 18 to 22 °C.

7.2 Determination

Weigh, to the nearest 1 mg, about 0,5 g of the sample into a glass vessel (5.2). Add 7 ml of the acetone (clause 4) and shake for exactly 2 min (see note 1). Allow the acetone-soluble fraction to clear and decant it into the tared, dry evaporating dish (5.3). If the fraction does not clear, it may be centrifuged for 1 min and then decanted, or filtered if necessary (see note 2), into the evaporating dish (see note 3).

Add a further 7 ml of the acetone to the glass vessel and repeat the above extraction until three extractions have been carried out or the extractant is clear, whichever is achieved first. If a filter has been used, rinse it with a few millilitres of the acetone and add the rinsings to the evaporating dish.

Place the evaporating dish in the vacuum drying oven (5.4) and evaporate off the acetone at 80 ± 2 °C and about 50 kPa. Alternatively, the evaporation may be carried out using the infra-red drying lamp (5.6). Transfer the dish to the air oven (5.5) and dry to constant mass at 105 ± 3 °C.

NOTES

1 Warming of the solvent may be minimized by holding the glass vessel at the upper end between the index and middle fingers, while the thumb secures the ground glass stopper. Rubber finger-shields should be worn.

2 Since the acetone solution will creep up the filter paper, the smallest convenient size of paper should be used.

3 Any particles of toluene-soluble extract adhering to the upper end of the glass vessel after shaking should be washed back by cautious tilting and the fraction again left to settle, or centrifuged.

8 Expression of results

The acetone-soluble material, Ac_{20}, in the sample analysed, expressed as a percentage by mass, is given by the equation

$$Ac_{20} = \frac{Km_2}{m_1}$$

where

m_1 is the mass, in grams, of toluene-soluble extract taken;

m_2 is the mass, in grams, of acetone-soluble material recovered;

$K = 100 + 2{,}5\,(20 - t)$

in which $t = \dfrac{t_1 + t_2 + t_3}{3}$

t_1 being the temperature, in degrees Celsius, of the acetone used for the extraction;

t_2 being the ambient temperature, in degrees Celsius, at the beginning of the determination;

t_3 being the ambient temperature, in degrees Celsius, at the end of the determination.

The result (the mean of duplicate determinations, see 9.1) shall be reported to the nearest 0,1 % (m/m).

9 Precision of the method

Amount of acetone-soluble material % (m/m)	Maximum acceptable differences between results	
	Repeatability	Reproducibility
Less than 20	0,3 % absolute	0,5 % absolute
20 to 30	0,4 % absolute	0,7 % absolute
30 to 50	0,5 % absolute	0,9 % absolute
Over 50	1,0 % of the mean result	1,8 % of the mean result

9.1 Repeatability

The results of duplicate determinations, carried out at different times in the same laboratory by the same operator with the same apparatus on the same toluene-soluble fraction, shall not differ by more than the above value.

9.2 Reproducibility

The means of the results of duplicate determinations, carried out in two different laboratories on representative test portions taken from the same toluene-soluble fraction, shall not differ by more than the above value.

10 Test report

The test report shall include the following particulars:

a) identification of the product tested;

b) the reference of the method used;

c) the results and the method of expression used;

d) any unusual features noted during the determination;

e) any operation not included in this International Standard or in the International Standard to which reference is made, or regarded as optional.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc : No. PCD 7 (2049).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 2323 0131, 2323 3375, 2323 9402 *Website :* www.bis.org.in

Regional Offices : *Telephones*

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110 002 — 2323 7617, 2323 3841

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Kankurgachi, KOLKATA 700 054 — 2337 8499, 2337 8561, 2337 8626, 2337 9120

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160 022 — 260 3843, 260 9285

Southern : C. I. T. Campus, IV Cross Road, CHENNAI 600 113 — 2254 1216, 2254 1442, 2254 2519, 2254 2315

Western : Manakalaya, E9 MIDC, Marol, Andheri (East), MUMBAI 400 093 — 2832 9295, 2832 7858, 2832 7891, 2832 7892

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.

Printed at New India Printing Press, Khurja, India